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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/942,718	08/31/2001	Masataka Shirai	NIT-302	8857

7590 10/07/2002

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EXAMINER
FLORES RUIZ, DELMA R

ART UNIT	PAPER NUMBER
2828	

DATE MAILED: 10/07/2002

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	09/942,718	SHIRAI ET AL.	
	Examiner	Art Unit	
	Delma R. Flores Ruiz	2828	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *31 August 2001* .

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-14* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-14* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

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Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☒ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

11)☐ The proposed drawing correction filed on _____ is: a)☐ approved b)☐ disapproved by the Examiner.

If approved, corrected drawings are required in reply to this Office action.

12)☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

13)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____ .

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

14)☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).

a) ☐ The translation of the foreign language provisional application has been received.

15)☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s) _____ .
4) ☐ Interview Summary (PTO-413) Paper No(s). _____ .
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: .

DETAILED ACTION

Drawings

The drawings are objected to as failing to comply with 37 CFR 1.84(p)(5) because they include the following reference sign(s) not mentioned in the description:

Fig. 5, character 11,

Fig. 7, characters 24, 110, and 111, and

Fig. 8, character 28.

A proposed drawing correction, corrected drawings, or amendment to the specification to add the reference sign(s) in the description, are required in reply to the Office action to avoid abandonment of the application. The objection to the drawings will not be held in abeyance.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

Claims 1 - 14 rejected under 35 U.S.C. 103(a) as being unpatentable over Tohyama et al (5,642,371) in view of Epler et al (4,962,057).

Regarding claims 1 – 4, and 11 – 14, Tohyama discloses a module for optical communication having a semiconductor laser active (see Figs. 16 – 18, Character 55, Column 14, lines 57 – 67, Column 15, lines 1 – 6), an optical modulation region (Column 13, lines 4 – 11, Column 20, lines 23 – 34) for modulating the light from the semiconductor laser active region and a temperature control region (see Figs. 16 – 18, Character 70, Column 2, lines 27 – 37, Column 3, lines 5 – 67, Column 10, lines 6 – 17, Column 15, lines 39 – 49) for the temperature control at least the optical modulation region in which the semiconductor laser active region has a multiple quantum well structure (see Figs. 16 – 18, Character 55 and 53) having at least two quaternary mixed crystal layers selected from the group consisting of quaternary mixed compound of In, Ga, Al and As and a quaternary mixed compound of Un, Ga, N and As (see Figs. 27A to 27 C, Column 24, lines 56 – 67, Column 25, lines 1 – 39), the temperature control component is a heating component or a heater and the control temperature control component is disposed without having a cooling component (see Figs. 16 – 18, Character 70, Column 2, lines 27 – 37, Column 3, lines 5 – 67, Column 10, lines 6 – 17, Column 15, lines 39 – 49). Tohyama discloses the claimed invention except for at least the temperature of the semiconductor laser active region or the temperature of a

component in thermally contact with the semiconductor laser active region for holding the semiconductor laser active region can be set to 35^0 C or higher during operation of the semiconductor laser active region and the optical modulation region. It would have been obvious to one having ordinary skill in the art at the time of the invention was made to at least the temperature of the semiconductor laser active region or the temperature of a component in thermally contact with the semiconductor laser active region for holding the semiconductor laser active region can be set to 35^0 C or higher during operation of the semiconductor laser active region and the optical modulation region, to combine Epler of teaching a the temperature of the semiconductor laser active region or the temperature of a component in thermally contact with the semiconductor laser active region for holding the semiconductor laser active region can be set to 35^0 C or higher during operation of the semiconductor laser active region and the optical modulation region with optical communication because changes in growth rate are accomplished by varying the growth surface temperature via changes in beam intensity or power density or substrate temperatures or combinations thereof. Further, techniques in MBE processing using thermal evaporation have been employed to provide a pattern in heterostructure. In one case, a plurality of GaAs quantum well layers separated by AlGaAs barrier layers were grown in MBE on a GaAs substrate mounted on a slotted suspect so that a temperature differential is established across the supported substrate. In this manner, the thickness of the deposited GaAs and AlGaAs layers would be thinner over deposited regions on firm substrate having a 30^0

C. to 50^0 C . higher temperature gradient over substrate temperature compared to adjacent regions over suspected recesses. The operating temperature for AlGaAs will be higher than that for GaAs because the Al content in AlGaAs causes a slower evaporation rate since GaAs has a higher vapor pressure than AlGaAs. Higher evaporation rates require higher temperatures, which begin to reach a point where damage to the crystal can occur, first, by steep thermal gradients in the film that stress the crystal and, secondly, by melting the material and possibly bring on ablation, all of which conditions are undesirable. For example, congruent evaporation of GaAs occurs around 950^0 C in an attending ambient mixture of AsH_3 and H_2 (otherwise, at about 680^0 C in a vacuum) and GaAs will begin to melt at about 1240^0 C, since it has been held that discovering an optimum value of a result effective variable involves only routine skill in the art. In re Boesch, 617 F.2d 272, 205 USPQ 215 (CCPA 1980).

Regarding claims 5 – 10 Tohyama discloses a module for optical communication having a semiconductor laser active (see Figs. 16 – 18, Character 55, Column 14, lines 57 – 67, Column 15, lines 1 – 6), having at least two active regions, (see Figs. 16 – 18, Character 53 and 55) an optical modulation region (Column 13, lines 4 – 11, Column 20, lines 23 – 34) for modulating the light from the semiconductor laser active region and a temperature control region (see Figs. 16 – 18, Character 70, Column 2, lines 27 – 37, Column 3, lines 5 – 67, Column 10, lines 6 – 17, Column 15, lines 39 – 49) for the temperature control at least the optical modulation region in which

the semiconductor laser active region has a multiple quantum well structure (see Figs. 16 – 18, Character 55 and 53) having at least two quaternary mixed crystal layers selected from the group consisting of quaternary mixed compound of In, Ga, Al and As and a quaternary mixed compound of Un, Ga, N and As (see Figs. 27A to 27 C, Column 24, lines 56 – 67, Column 25, lines 1 – 39), the temperature control component is a heating component or a heater and the control temperature control component is disposed without having a cooling component (see Figs. 16 – 18, Character 70, Column 2, lines 27 – 37, Column 3, lines 5 – 67, Column 10, lines 6 – 17, Column 15, lines 39 – 49). The semiconductor laser chip region and the optical modulation region are constituted, respectively, with semiconductor chip regions separately from each other and are constituted as semiconductor chip region integrated in one identical substrate (see Figs 16 – 18). Tohyama discloses the claimed invention except for at least the temperature of the semiconductor laser active region or the temperature of a component in thermally contact with the semiconductor laser active region for holding the semiconductor laser active region can be set to 30^0 C or higher during operation of the semiconductor laser active region and the optical modulation region. It would have been obvious to one having ordinary skill in the art at the time of the invention was made to at least the temperature of the semiconductor laser active region or the temperature of a component in thermally contact with the semiconductor laser active region for holding the semiconductor laser active region can be set to 30^0 C or higher

during operation of the semiconductor laser active region and the optical modulation region, to combine Epler of teaching a the temperature of the semiconductor laser active region or the temperature of a component in thermally contact with the semiconductor laser active region for holding the semiconductor laser active region can be set to 30^0 C or higher during operation of the semiconductor laser active region and the optical modulation region with optical communication because changes in growth rate are accomplished by varying the growth surface temperature via changes in beam intensity or power density or substrate temperatures or combinations thereof. Further, techniques in MBE processing using thermal evaporation have been employed to provide a pattern in heterostructure. In one case, a plurality of GaAs quantum well layers separated by AlGaAs barrier layers were grown in MBE on a GaAs substrate mounted on a slotted suspect so that a temperature differential is established across the supported substrate. In this manner, the thickness of the deposited GaAs and AlGaAs layers would be thinner over deposited regions on firm substrate having a 30^0 C. to 50^0 C . higher temperature gradient over substrate temperature compared to adjacent regions over suspected recesses. he operating temperature for AlGaAs will be higher than that for GaAs because the Al content in AlGaAs causes a slower evaporation rate since GaAs has a higher vapor pressure than AlGaAs. Higher evaporation rates require higher temperatures, which begin to reach a point where damage to the crystal can occur, first, by steep thermal gradients in the film that stress

the crystal and, secondly, by melting the material and possibly bring on ablation, all of which conditions are undesirable. For example, congruent evaporation of GaAs occurs around 950^0 C in an attending ambient mixture of AsH_3 and H_2 (otherwise, at about 680^0 C in a vacuum) and GaAs will begin to melt at about 1240^0 C, since it has been held that discovering an optimum value of a result effective variable involves only routine skill in the art. In re Boesch, 617 F.2d 272, 205 USPQ 215 (CCPA 1980

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Delma R. Flores Ruiz whose telephone number is (703) 308-6238. The examiner can normally be reached on M - F.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Paul Ip can be reached on (703) 308-3098. The fax phone numbers for the organization where this application or proceeding is assigned are (703) 308-7722 for regular communications and (703) 308-7724 for After Final communications.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703) 306-3431.

Delma R. Flores Ruiz
Examiner
Art Unit 2828

Paul Ip
Supervisor Patent Examiner
Art Unit 2828

DRFR/PI
September 30, 2002